

WE CLAIM:

1. An isolated oligonucleotide having a nucleotide sequence selected from the group consisting of SEQ ID NO: 3, SEQ ID NO 4, SEQ ID NO: 5, SEQ ID NO: 6, SEQ ID NO: 7, SEQ ID NO: 8, SEQ ID NO: 9, SEQ ID NO: 10, SEQ ID NO: 11 and SEQ ID NO: 12.
2. The oligonucleotide of claim 1 wherein the sequence is SEQ ID NO: 3.
3. The oligonucleotide of claim 1 wherein the sequence is SEQ ID NO: 4.
4. The oligonucleotide of claim 1 wherein the sequence is SEQ ID NO: 5.
5. The oligonucleotide of claim 1 wherein the sequence is SEQ ID NO: 6.
6. The oligonucleotide of claim 1 wherein the sequence is SEQ ID NO: 7.
7. The oligonucleotide of claim 1 wherein the sequence is SEQ ID NO: 8.
8. The oligonucleotide of claim 1 wherein the sequence is SEQ ID NO: 9.
9. The oligonucleotide of claim 1 wherein the sequence is SEQ ID NO: 10.
10. The oligonucleotide of claim 1 wherein the sequence is SEQ ID NO: 11.

11. The oligonucleotide of claim 1 wherein the sequence is SEQ ID NO:
12.

12. An oligonucleotide probe comprising one or more oligonucleotides
of claim 1 wherein said probe has the formula

5 [X-Y-Z]_n

wherein X is a sequence of 0 to 100 nucleotides or nucleotide analogs;
Y is said one or more oligonucleotides,
Z is a sequence of 0 to 100 nucleotides or nucleotide analogs, and
N is 1-500.

10 13. An isolated oligonucleotide having a nucleotide sequence selected
from the group consisting of SEQ ID NO: 13, SEQ ID NO: 14, SEQ ID NO: 15,
SEQ ID NO: 16, SEQ ID NO: 17, SEQ ID NO: 18, SEQ ID NO: 19, SEQ ID NO:
20, SEQ ID NO: 21, SEQ ID NO: 22, and SEQ ID NO: 23.

15 14. The oligonucleotide of claim 13 wherein the sequence is SEQ ID
NO: 13.

15. The oligonucleotide of claim 13 wherein the sequence is SEQ ID
NO: 14.

20 16. The oligonucleotide of claim 13 wherein the sequence is SEQ ID
NO: 15.

17. The oligonucleotide of claim 13 wherein the sequence is SEQ ID
NO: 16.

18. The oligonucleotide of claim 13 wherein the sequence is SEQ ID
NO: 17.

19. The oligonucleotide of claim 13 wherein the sequence is SEQ ID NO: 18.
20. The oligonucleotide of claim 13 wherein the sequence is SEQ ID NO: 19.
- 5 21. The oligonucleotide of claim 13 wherein the sequence is SEQ ID NO: 20.
22. The oligonucleotide of claim 13 wherein the sequence is SEQ ID NO: 21.
- 10 23. The oligonucleotide of claim 13 wherein the sequence is SEQ ID NO: 22.
24. The oligonucleotide of claim 13 wherein the sequence is SEQ ID NO: 23.
25. The oligonucleotide of claim 13 wherein the sequence is SEQ ID NO: 23.
- 15 26. An oligonucleotide probe comprising one or more ogligonucleotides of claim 13 wherein said probe has the formula
- $$[X-Y-Z]_n$$
- wherein X is a sequence of 0 to 100 nucleotides or nucleotide analogs; Y is said one or more oligonucleotide, and
- 20 Z is a sequence of 0 to 100 nucleotides or nucleotide analogs, and N is 1-500.
27. A pair of oligonucleotides selected from the group of oligonucleotides having the nucleotide sequences SEQ ID NO: 15 and SEQ ID NO:

8; SEQ ID NO: 16 and SEQ ID NO: 8; SEQ ID NO: 17 and SEQ ID NO: 20 and SEQ ID NO:21 and SEQ ID NO: 8.

28. The pair of oligonucleotides of claim 27 wherein the nucleotide sequences of the oligonucleotides are SEQ ID NO:15 and SEQ ID NO:8.

5 29. The pair of oligonucleotides of claim 27 wherein the nucleotide sequences of the oligonucleotides are SEQ ID NO:16 and SEQ ID NO:8

30. The pair of oligonucleotides of claim 27 wherein the nucleotide sequences of the oligonucleotides are SEQ ID NO:17 and SEQ ID NO:20.

10 31. The pair of oligonucleotides of claim 27 wherein the nucleotide sequences of the oligonucleotides are SEQ ID NO:21 and SEQ ID NO:8

32. A method of detecting a raphidophyte cell, comprising:

a) permeabilizing said cell to expose the ribosomal RNA of said cell wherein said RNA has hypervariable regions;

15 b) contacting the exposed RNA under hybridizing conditions with oligonucleotide probes capable of selectively hybridizing to said hypervariable regions to form a hybridization complex and

c) identifying said hybridization complex to detect said raphidophyte cell.

33. The method of claim 32 wherein said hybridization complex is identified in a sandwich hybridization assay.

20 34. The method of claim 32 wherein said hybridization complex is identified in a fluorescent in situ hybridization assay.

35. The method of claim 32 wherein said oligonucleotide probes have sequences selected from the group consisting of SEQ ID NO: 3, SEQ ID NO 4,

SEQ ID NO: 5, SEQ ID NO: 6, SEQ ID NO: 7, SEQ ID NO: 8, SEQ ID NO: 9,
SEQ ID NO: 10, SEQ ID NO: 11 and SEQ ID NO: 12.

36. The method of claim 32 wherein said oligonucleotide probes have
sequences selected from the group consisting of SEQ ID NO: 13, SEQ ID NO: 14,
5 SEQ ID NO: 15, SEQ ID NO: 16, SEQ ID NO: 17, SEQ ID NO: 18, SEQ ID NO:
19, SEQ ID NO: 20, SEQ ID NO: 21, SEQ ID NO: 22 and SEQ ID NO:23.

37. An oligonucleotide kit for detection of raphidophyte cells
comprising one or more oligonucleotides having a nucleotide sequence selected
from the group consisting of SEQ ID NO: 3, SEQ ID NO 4, SEQ ID NO: 5, SEQ
10 ID NO: 6, SEQ ID NO: 7, SEQ ID NO: 8, SEQ ID NO: 9, SEQ ID NO: 10, SEQ
ID NO: 11 and SEQ ID NO: 12.

38. The kit of claim 37 further including one or more hybridization
buffers.

39. An oligonucleotide kit for detection of raphidophyte cells
comprising one or more oligonucleotides having a nucleotide sequence selected
from the group consisting of SEQ ID NO: 13, SEQ ID NO: 14, SEQ ID NO: 15,
15 SEQ ID NO: 16, SEQ ID NO: 17, SEQ ID NO: 18, SEQ ID NO: 19, SEQ ID NO:
20, SEQ ID NO: 21, and SEQ ID NO: 22 and SEQ ID NO:23.

40. The kit of claim 39 further including one or more hybridization
20 buffers.